Commonwealth of Kentucky
Division for Air Quality

STATEMENT OF BASIS / SUMMARY

Title V, Operating
Permit ID: V-20-024
Tennessee Gas Pipeline Company, L.L.C. - Station 96
1380 Hobson Road, Campbellsville, KY 42718
September 22, 2020
Source ID: 21-217-00033
Agency Interest #: 44056
Activity ID: APE20200001

Table of Contents

SECTION 1 - SOURCE DESCRIPTION

SIC Code and description: 4922, Natural Gas Transmission.

Single Source Det. ☐ Yes ☒ No If Yes, Affiliated Source AI:

Source-wide Limit ☐ Yes ☒ No If Yes, See Section 4, Table A

28 Source Category ☐ Yes ☒ No If Yes, Category:

County: Taylor
Nonattainment Area ☒ N/A ☐ PM_{10} ☐ $PM_{2.5}$ ☐ CO ☐ NO_X ☐ SO_2 ☐ Ozone ☐ Lead
If yes, list Classification:

PTE* greater than 100 tpy for any criteria air pollutant ☒ Yes ☐ No
If yes, for what pollutant(s)?
☐ PM_{10} ☐ $PM_{2.5}$ ☒ CO ☒ NO_X ☐ SO_2 ☒ VOC

PTE* greater than 250 tpy for any criteria air pollutant ☒ Yes ☐ No
If yes, for what pollutant(s)?
☐ PM_{10} ☐ $PM_{2.5}$ ☒ CO ☒ NO_X ☐ SO_2 ☐ VOC

PTE* greater than 10 tpy for any single hazardous air pollutant (HAP) ☒ Yes ☐ No
If yes, list which pollutant(s): Formaldehyde

PTE* greater than 25 tpy for combined HAP ☒ Yes ☐ No

*PTE does not include self-imposed emission limitations.

Description of Facility:
The station receives natural gas via pipeline from upstream sources, compresses it using reciprocating internal combustion engines (RICE), and then transmits it via pipeline to downstream compressor stations.

SECTION 2 – CURRENT APPLICATION AND EMISSION SUMMARY FORM

Permit Number: V-20-024 Activity: APE20200001
Application Received: 7/22/2020 Application Complete: 9/22/2020

Permit Action: ☐Initial ☒Renewal ☐Significant Rev. ☐Minor Rev. ☐Administrative

Construction/Modification Requested? ☐Yes ☒No NSR Applicable? ☐Yes ☒No

Previous 502(b)(10) or Off-Permit Changes incorporated with this permit action ☐Yes ☒No

Description of Action:

- Update of 401 KAR 59:015, Section 7 language.
- Review and removal of the one-time energy assessment requirement for 40 CFR 63, Subpart DDDDD from permit.
- Update of EU20's emission factors for CO and NO_X to match manufacturer's guarantee.
- Addition of HAP emissions from fugitive components.

V-20-024 Emission Summary		
Pollutant	**2019 Actual (tpy)**	**V-20-024 (tpy)**
CO	78.78	386.67
NO_X	866.80	4871.5
PT	10.76	51.98
PM_{10}	10.76	51.98
$PM_{2.5}$	10.76	51.98
SO_2	0.16	0.66
VOC	29.41	140.75
Lead	1.07×10^{-3}	5.0×10^{-3}
Greenhouse Gases (GHGs)		
Carbon Dioxide	31,449	131,416
Methane	0.47	4.08
Nitrous Oxide	0.054	0.25
CO_2 Equivalent (CO_2e)	31,477	131,592
Hazardous Air Pollutants (HAPs)		
Acetaldehyde	1.67	8.29
Acrolein	1.67	8.3
Benzene	0.42	2.1
Formaldehyde	11.85	59.02
Hexane	0.18	0.99
Methanol	0.47	2.65
Toluene	0.21	1.03
Combined HAPs:	16.47	83.33

SECTION 3 – EMISSIONS, LIMITATIONS AND BASIS

Emission Unit E01-E19, 2 Stroke Lean Burn (2SLB) Reciprocating Compression Engines (19)

Initial Construction Date: See Process Description

Process Description: None of the listed emission units have control devices.

E01 [96-B-04],	**Description:**	
E02 [96-B-05]	Model:	Cooper-Bessemer GMV-10
	Primary Fuel:	Natural Gas
	Power Output:	1,100 hp each
	Max Operating Rate:	12.175 mmBtu/hr each
	Construction Date:	1948
E03 [96-B-06],	**Description:**	
E04 [96-B-07], and	Model:	Cooper-Bessemer GMV-10
E05 [96-B-08]	Primary Fuel:	Natural Gas
	Power Output:	1,100 hp each
	Max Operating Rate:	12.175 mmBtu/hr each
	Construction Date:	1949
E06 [96-B-09],	**Description:**	
E07 [96-B-10]	Model:	Cooper-Bessemer GMV-10TF
	Primary Fuel:	Natural Gas
	Power Output:	1,350 hp each
	Max Operating Rate:	12.99 mmBtu/hr each
	Construction Date:	1950
E08 [96-C-01],	**Description:**	
E09 [96-C-02],	Model:	Cooper-Bessemer GMV-10TF
E10 [96-C-03],	Primary Fuel:	Natural Gas
E11 [96-C-04],	Power Output:	1,350 hp each
E12 [96-C-05], and	Max Operating Rate:	12.99 mmBtu/hr each
E13 [96-C-06]	Construction Date:	1952
E14 [96-C-07], and	**Description:**	
E15 [96-C-08]	Model:	Cooper-Bessemer GMV-10
	Primary Fuel:	Natural Gas
	Power Output:	1,350 hp each
	Max Operating Rate:	13.14 mmBtu/hr each
	Construction Date:	1956
E16 [96-C-09],	**Description:**	
E17 [96-C-10],	Model:	Cooper-Bessemer GMV-10
E18 [96-C-11], and	Primary Fuel:	Natural Gas
E19 [96-C-12]	Power Output:	1,350 hp each
	Max Operating Rate:	13.14 mmBtu/hr each
	Construction Date:	1957

Emission Unit E01-E19, 2 Stroke Lean Burn (2SLB) Reciprocating Compression Engines (19)

Applicable Regulation:
401 KAR 63:002, Section 2(4)(eeee), 40 C.F.R. 63.6580 to 63.6675, Tables 1a to 8, and Appendix A (Subpart ZZZZ), National Emission Standards for Hazardous Air Pollutants for Stationary Reciprocating Internal Combustion Engines.

Comments:
NO_X and CO emissions are calculated using emission factors from similar units in the Tennessee gas production database. Greenhouse gases are calculated using 40 CFR 98, Subpart C Table 1 and 2 for natural gas. All other pollutants are calculated using AP-42, Table 3.2-1 for Two stroke lean burn engines.

Pursuant to 40 CFR 63.6590(b)(3)(i), existing spark ignition 2 stroke lean burn (2SLB) stationary RICE with a site rating of more than 500 hp located at a major source of HAP emissions do not have to meet the requirements of 40 CFR 63, Subpart ZZZZ or 40 CFR 63, Subpart A, including initial notification requirements. The 1,100 hp and 1,350 hp stationary RICE are 2SLB, therefore, there are no requirements pursuant to 40 CFR 63, Subpart ZZZZ.

Emission Unit E20 4SLB Reciprocating Emergency Engine (96-C-Aux-01)

Initial Construction Date: 2000

Process Description:

Model:	Caterpillar G3516TA
Primary Fuel:	Natural Gas
Power Output:	1,025 hp
Max Operating Rate:	8.1 mmBtu/hr
Controls:	None

Applicable Regulation:
401 KAR 63:002, Section 2(4)(eeee), 40 C.F.R. 63.6580 to 63.6675, Tables 1a to 8, and Appendix A (Subpart ZZZZ), National Emission Standards for Hazardous Air Pollutants for Stationary Reciprocating Internal Combustion Engines.

Comments:
NO_X and CO emissions are calculated based on manufacturer's guarantees. Greenhouse gases are calculated using 40 CFR 98, Subpart C Table 1 and 2 for natural gas. All other pollutants are calculated using AP-42, Table 3.2-2 for four stroke lean burn engines.

Pursuant to 40 CFR 63.6590(b)(3)(ii), existing spark ignition 4 stroke lean burn (4SLB) stationary RICE with a site rating of more than 500 brake HP located at a major source of HAP emissions do not have to meet the requirements of 40 CFR 63, Subpart ZZZZ and 40 CFR 63, Subpart A. Therefore, the permittee shall comply with 40 CFR 63, Subpart ZZZZ for the 1,025 HP emergency engine by meeting the requirements to be considered an emergency engine as defined in 40 CFR 63.6675.

Note: D.C. Circuit Court [*Delaware v. EPA*, 785 F. 3d 1 (D.C. Cir. 2015)] has vacated the provisions in 40 CFR 63, Subpart ZZZZ and 40 CFR 60, Subpart IIII that contain the 100-hour exemption for operation of emergency engines for purposes of emergency demand response under 40 CFR 63.6640(f)(2)(ii)-(iii) and 40 CFR 60.4211(f)(2)(ii)-(iii). The D.C. Circuit Court issued the mandate for the vacatur on May 4, 2016.

Emission Unit E21 and E22 Jacket Water Heaters				
Pollutant	**Emission Limit or Standard**	**Regulatory Basis for Emission Limit or Standard**	**Emission Factor Used and Basis**	**Compliance Method**
PM	E21: 0.56 lb/mmBtu	401 KAR 59:015, Section 4(1)(a)	7.6 lb/mmscf, AP-42 Chapter 1.4.	Assumed based upon natural gas combustion
	E22: 0.54 lb/mmBtu	401 KAR 59:015, Section 4(1)(c)		
	20% opacity	401 KAR 59:015, Section 4(2)	N/A	
SO_2	E21: 3.0 lb/mmBtu	401 KAR 59:015, Section 5(1)(a)1.	0.6 lb/mmscf, AP-42 Chapter 1.4.	
	E22: 2.78 lb/mmBtu	401 KAR 59:015, Section 5(1)(c)2.b.		

Initial Construction Date: E21: 1984, E22: 2000

Process Description:

E21 [96-HEATER-01] **Description:**

Model:	NATCO (Jacket Water Heater)
Primary Fuel:	Natural Gas
Max Operating Rate:	4.5 mmBtu/hr
Controls:	None

E22 [96-HEATER-02] **Description:**

Model:	NATCO (Jacket Water Heater)
Primary Fuel:	Natural Gas
Max Operating Rate:	7.5 mmBtu/hr
Controls:	None

Applicable Regulation:
401 KAR 59:015, New Indirect Heat Exchangers.

401 KAR 63:002, Section 2(4)(iiii), 40 C.F.R. 63.7480 to 63.7575, Tables 1 to 13 (Subpart DDDDD), National Emission Standards for Hazardous Air Pollutants for Major Sources: Industrial, Commercial, and Institutional Boilers and Process Heaters.

Comments:
Greenhouse gas emissions are calculated using 40 CFR 98, Subpart C Tables C-1 and C-2. All other pollutant emissions are calculated using AP-42 Tables 1.4-1 through 1.4-4 for natural gas combustion.

Pursuant to Table 3, Item 4 of 40 CFR 63, Subpart DDDDD, a one-time energy assessment must be performed. This was conducted by TRC Environmental Corporation on November 11, 2014.

Emission Unit 23 [96-HEATER-20] Waste Water Evaporator

Initial Construction Date: 2002

Process Description:

Model:	SAMSCO 600-316 (Waste Water Evaporator)
Primary Fuel:	Natural Gas
Max Operating Rate:	0.395 mmBtu/hr
Controls:	None

Applicable Regulation:

401 KAR 63:002, Section 2(4)(iiii), 40 C.F.R. 63.7480 to 63.7575, Tables 1 to 13 (Subpart DDDDD), National Emission Standards for Hazardous Air Pollutants for Major Sources: Industrial, Commercial, and Institutional Boilers and Process Heaters.

Comments:

Greenhouse gas emissions are calculated using 40 CFR 98, Subpart C Tables C-1 and C-2. All other pollutant emissions are calculated using AP-42 Tables 1.4-1 through 1.4-4 for natural gas combustion.

Pursuant to Table 3, Item 4 of 40 CFR 63, Subpart DDDDD, a one-time energy assessment must be performed. This was conducted by TRC Environmental Corporation on November 11, 2014.

SECTION 3 – EMISSIONS, LIMITATIONS AND BASIS (CONTINUED)

Testing Requirements\Results
N/A

SECTION 4 – SOURCE INFORMATION AND REQUIREMENTS

Table A - Group Requirements:
N/A

Table B - Summary of Applicable Regulations:

Applicable Regulations	Emission Unit
401 KAR 59:015, New Indirect Heat Exchangers.	E21, E22
401 KAR 63:002, Section 2(4)(eeee), 40 C.F.R. 63.6580 to 63.6675, Tables 1a to 8, and Appendix A (Subpart ZZZZ), National Emission Standards for Hazardous Air Pollutants for Stationary Reciprocating Internal Combustion Engines.	E1-E20
401 KAR 63:002, Section 2(4)(iiii), 40 C.F.R. 63.7480 to 63.7575, Tables 1 to 13 (Subpart DDDDD), National Emission Standards for Hazardous Air Pollutants for Major Sources: Industrial, Commercial, and Institutional Boilers and Process Heaters.	E21-E23

Table C - Summary of Precluded Regulations:
N/A

Table D - Summary of Non Applicable Regulations:
N/A

Air Toxic Analysis
401 KAR 63:020, Potentially Hazardous Matter or Toxic Substances
The Division for Air Quality (Division) has performed SCREEN View on September 22, 2020 of potentially hazardous matter or toxic substances (Benzene and Hexane) that may be emitted by the facility based upon the process rates, material formulations, stack heights and other pertinent information provided by the applicant. Based upon this information, the Division has determined that the conditions outlined in this permit will assure compliance with the requirements of 401 KAR 63:020.

Single Source Determination
N/A

SECTION 5 - PERMITTING HISTORY

Permit	Permit type	Activity#	Complete Date	Issuance Date	Summary of Action	PSD/Syn Minor
G-04-001 R1	Renewal	APE20040001	6/26/2006	5/27/2005	NA	NA
G-09-002	Renewal	APE20090001	2/11/2010	10/4/2010	Renewal Permit	No
G-09-002 R1	Admin Amend	APE20120001	6/14/2012	6/25/2012	Admin Amendment	No
V-15-049	Renewal	APE20150001	9/22/2015	2/4/2016	Renewal Permit	No

SECTION 6 – PERMIT APPLICATION HISTORY:

N/A

APPENDIX A – ABBREVIATIONS AND ACRONYMS

AAQS – Ambient Air Quality Standards
BACT – Best Available Control Technology
Btu – British thermal unit
CAM – Compliance Assurance Monitoring
CO – Carbon Monoxide
Division – Kentucky Division for Air Quality
ESP – Electrostatic Precipitator
GHG – Greenhouse Gas
HAP – Hazardous Air Pollutant
HF – Hydrogen Fluoride (Gaseous)
MSDS – Material Safety Data Sheets
mmHg – Millimeter of mercury column height
NAAQS – National Ambient Air Quality Standards
NESHAP – National Emissions Standards for Hazardous Air Pollutants
NO_x – Nitrogen Oxides
NSR – New Source Review
PM – Particulate Matter
PM_{10} – Particulate Matter equal to or smaller than 10 micrometers
$PM_{2.5}$ – Particulate Matter equal to or smaller than 2.5 micrometers
PSD – Prevention of Significant Deterioration
PTE – Potential to Emit
SO_2 – Sulfur Dioxide
TF – Total Fluoride (Particulate & Gaseous)
VOC – Volatile Organic Compounds

APPENDIX B – INDIRECT HEAT EXCHANGER HISTORY

Emission Unit	Construction Date	Date Removed	Heat Capacity (MMBtu/hr)	Total For the Year (T)	PM Emission Limit (E_P)*	SO_2 Emission Limit (E_S)**
E21	1984	NA	4.5	4.5	0.56 lb/MMBtu	3.0 lb/MMBtu
E22	2000		7.5	12	0.54 lb/MMBtu	2.78 lb/MMBtu

*$E_P = 0.9634(T^{-0.2356})$ in lb/MMBtu
**$E_S = 7.7223(T^{-0.4106})$ in lb/MMBtu